

# **COLOSSUS ON MAIN STREET: TACTICAL CONSIDERATIONS OF HEAVY ARMOR AND FUTURE MOUT DOCTRINE**

**A MONOGRAPH  
BY  
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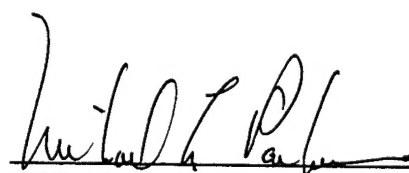
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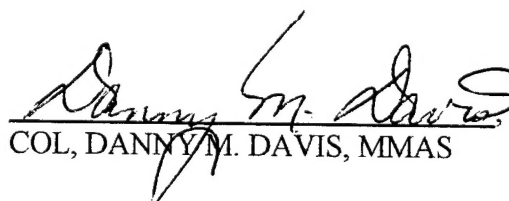
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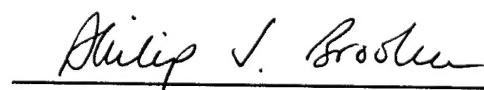
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## ABSTRACT

### COLOSSUS ON MAIN STREET: TACTICAL CONSIDERATIONS OF HEAVY ARMOR AND FUTURE MOUT DOCTRINE

by Major Curt Lapham, USA, 40 pages.

This monograph begins by reviewing the current status of United States land forces doctrine for military operations on urbanized terrain (MOUT) with an emphasis on the proposed role of the main battle tank.

The monograph next presents four case studies of urban combat involving the use of the main battle tank. The studies used include: Aachen, Germany 1944, Berlin in 1945, Hue City, Vietnam in 1968, and Suez City in the 1973 Yom Kippur War. The purpose of these case studies is to determine the role of the modern main battle tank in urban warfare across the continuum of military operations ranging from peace enforcement to high-intensity warfare. An analysis of these operations reveals the usefulness of the main battle tank across the entire spectrum urban warfare.

The monograph concludes that the current doctrine fails to address the use of the main battle tank on urban terrain. The goal of this paper is to act as a catalyst for the Army to address this doctrinal shortfall. The facts suggest first, that simply avoiding military operations in cities is no longer practical; secondly, Arab states, the United States Marine Corps, and Russia have recently employed heavy tanks to advantage during urban conflict. The United States Army needs to examine ways to utilize the main battle tank, a critical combat power multiplier in urban conflicts, in a new MOUT doctrine.

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## I -- INTRODUCTION

In May 1990, General Carl E. Vuono, Chief of Staff of the Army addressed America's Armored Forces to celebrate the 50th Anniversary of the combat arm of decision.<sup>1</sup> Less than ninety days later Saddam Hussein's legions descended upon Kuwait in an act of brutal aggression. Vuono's first imperative for Armor was to maintain a flexible, warfighting doctrine.<sup>2</sup> One year later, the aggressor was defeated and America's Armored Forces stood triumphant. The Chief of Staff returned to the 1991 Armor Conference at Fort Knox announcing a new military strategy based on force projection.<sup>3</sup> One of the foundational imperatives, once again, maintaining "an effective warfighting doctrine."<sup>4</sup>

The key word is versatility. An Armor Force that is versatile in its ability to satisfy the entire spectrum of conflict and yet still lethal. Vuono laid it out, "This means that your weapons and doctrine and your thinking must be applicable to diverse environments . . . encompassing the entire range of military operations from peacetime engagement to major war."<sup>5</sup>

The Armored Forces challenge was to forge the armored component of this new "Force Projection" Army. The author's review of the past five years reveals heavy armored forces playing a vital role in three urban conflicts. Combined, these battles encompass the entire spectrum of warfare, from peace enforcement to major war, as originally envisioned for the modern armor by the Army's Chief of Staff. These situations include: the Arab Coalition battle against Iraqi armor and mechanized forces

at Khafji, Saudi Arabia; United States Marine peace enforcement operations in Mogadishu, Somalia; and finally the Russian operations to retake Grozny from Chechen rebels. Each of these battles as well as current MOUT doctrine derives from the lessons of past urban battles involving tanks.

The rapid population growth of the world's urban centers remains unprecedented in mankind's history. There exist many graphic statistics that can quickly demonstrate the magnitude of this recent growth phenomenon. For example, more than half of all births today occur in major cities and urbanized areas.<sup>6</sup> On the African continent the 1990's found over one quarter of the population living in urban zones; before the next millennium, over 50 percent of all Africans will live in cities.<sup>7</sup>

Robert Kaplan, traveler and author who specializes in exploring the world's worst and unknown rural and urban areas recently wrote on this very subject. He observed "in an age of decaying cities . . . Africa shows how the urban environment may come to represent the locus of future conflict in the developing world."<sup>8</sup>

Many sources estimate that 40 percent of Second World War battles centered on urban concentrations. In Europe the rapid expansion of its cities since 1945 represents a staggering estimate that in contemporary warfare 60 percent of the combat will take place in the cities.<sup>9</sup> Even AirLand Battle doctrine recognized that everything would not go smoothly. Rear areas would be subject as never before to attack and disruption by subversion and terrorist actions and by airmobile, amphibious and airborne forces, as well as by air interdiction and long range fires. Combat in built up areas including the



extensive urbanized sections of Germany would be inevitable. All of this adds up to a battlefield situation that would be extremely fluid.<sup>10</sup>

The implication for United States land forces is quite clear: our involvement in Operation Restore Hope type-scenarios will likely reoccur. Kaplan saw future MOUT actions as highly probable. He observed, "The perpetrators of future violence will likely be urban born, with no rural experience from which to draw."<sup>11</sup>

This study considers the development of United States military MOUT (Military Operations on Urban Terrain) doctrine, its current status, and perceived adequacy for using tanks. A historic review of armor's past contributions to urban warfare could provide many of the answers. The four battles studied will also facilitate comparing recent uses of main battle tanks with contemporary heavy-force MOUT doctrine.

The study will review current United States Army doctrine for Military Operations on Urbanized Terrain (MOUT) found in Field Manual (FM) 90-10, dated August 1979. The paper briefly examines current efforts to update this doctrine from recent lessons learned. The purpose also is to discover what is new or in the works, to include the USMC FMFM series for using armor in the urban environment.

A historical examination of four military operations, all pitched urban battles involving heavy armor. The four operations used in this study include: The Battle of Aachen -- 1944, the Battle of Berlin -- 1945, Hue -- 1968, and Suez City -- 1973.

The analysis considers the significant revealed MOUT doctrinal issues and discovered advantages and shortcomings of the main battle tank usage during each of these historical studies. The study concludes with recommendations for land force

doctrine writers to consider for developing future MOUT tactical doctrine and the roll of heavy armor on that urban battlefield.

## **II -- CURRENT MOUT ARMOR DOCTRINE**

### **Foundational MOUT Doctrine**

The 1979 edition of FM 90-10, the Army's authoritative guide to how Army forces fight urban wars, dedicated two pages in an appendix to armored forces in built-up areas.<sup>12</sup> There is a paradigm shift in third world countries from rural subsistence based economies to uncontrolled urbanization. The expected results of such a shift include: over population, rapid urban expansion, and civil unrest in many regions of the world. This infers increased involvement in MOUT specific missions for the United States Military, and as recent history has demonstrated, a commensurate increase in the role of armored forces. The author's examination of current MOUT doctrine of the United States Army and Marine Corps with a primary focus on armored forces begins with the Army's keystone doctrinal manual FM 100-5 Operations.

### **FM 100-5 Operations**

FM 100-5 provides to the Army an authoritative foundation for building subordinate doctrine capable of handling the entire variety of scenarios requiring Army force-projection.<sup>13</sup> Relevant to this study is the scenario of urban operations addressed by the manual in chapter 14, *The Environment of Combat*. Described are four major

physical elements for operations: geography, terrain, weather, and infrastructure. One of the five unique operations under the element of geography is urban operations, covered in a single paragraph.

Urban operations present unique and complex challenges to Army forces. Urban operations can occur in any of the geographical environments. They can constrain technological advantages; they impact on battle tempo; they force units to fight in small, decentralized elements; they also create difficult moral dilemmas due to the proximity of large numbers of civilians. Commanders must enforce discipline in their operations to minimize unnecessary collateral damage and civilian casualties.<sup>14</sup>

Of particular interest in FM 100-5's chapter fourteen- *Environment* is the description of the key element 'Terrain'. This section fails to even consider urbanized terrain important to the commander from the tactical through strategic level. Its absence is as interesting point when considering how the Army represents city warfare with the acronym MOUT -- Military Operations on Urban Terrain.

### **Urban Terrain Defined**

FM 90-10 describes military operations on urban terrain as "All military actions that are planned and conducted on a terrain complex where manmade construction impacts on the tactical options available to the commander."<sup>15</sup> This study considers city, urban area, built-up area as interchangeable, defined as "A concentration of structures, facilities, and population that forms the economic and cultural focus for the surrounding area."<sup>16</sup>

MOUT doctrine divides built-up areas into four categories: Strip area, an urban area built along a single road; villages (population less than 3,000), self-contained and agriculturally oriented; towns or small cities (population between 3,000 and 100,000), independent of large cities; and finally, large cities (population greater than 100,000) including associated suburbs a large city may cover over one hundred square miles.

### ***FM 90-10, Military Operations on Urbanized Terrain***

As mentioned earlier, the 1979 edition of FM 90-10, represents the Army's doctrine on how Army forces fight on urban terrain. The manual reflects the outdated 1976 era 'Active Defense' doctrine. Its orientation exclusively centers on MOUT operations directed against a Soviet threat based on the Central European model.<sup>17</sup> This fact greatly hinders the present value of some portions of this doctrine. Nevertheless, the core tactical principles, for example, the 3-phased deliberate attack methodology remains valid.

Appendix F of this manual briefly discusses the role of armored forces in urban battles. In summary, the tactical doctrine for employing tanks in offensive operations:

- Where the adjacent terrain permits, armor-heavy or balanced forces conduct envelopment and isolation of a built-up area.
- Armor-heavy forces are also suited for overrunning a small lightly defended built-up area.
- In the attack of a built-up area, tanks overwatch the infantry's initial assault until an entry into the area has been secured.

- Tanks must receive mutual support from infantry organic weapons to suppress enemy strongpoints and ATGMs while they move into positions to fire their main armament.<sup>18</sup>
- The manual completes MOUT armor doctrine by detailing how tanks support infantry with such obtuse observations as:
  - Tanks provide shock action and firepower.
  - Tanks smash through street barricades or reduce barricades by fires.
  - Tanks take under fire other targets designated by the infantry.
  - Tanks establish road blocks.<sup>19</sup>

### **MOUT Doctrinal Trends -- 1980s**

Michael Dormeyer's study of the adequacy of MOUT armor doctrine from the early 1980's observed there a general lack of doctrine concerning employment of heavy armor in cities. Specifically he noticed, "In all cases, these references are not specific and are of little value in clarifying for the armor crew member how to perform the tasks expected of him."<sup>20</sup> Remember, at the time, FM 90-10 was only three years old.

Dormeyer's observation is even more penetrating today regarding this eighteen year old manual, considering no new update is planned until early next century.<sup>21</sup>

FM 90-10's authors never intended for this field manual to supplant the How-to-Fight manuals in development at the time for the new M-1 tank and J-series organization. FM 90-10's preface states: "This manual . . . supplements the basic How-to Fight manuals describing urban terrain and the application of tactical principles at all echelons

from division to fire team . . . It provides the basic doctrine required for the combined arms team.”<sup>22</sup>

Tankers and Mechanized Infantry leaders from the early 1980’s will recall the draft additions of such How-to-Fight manuals as FM 71-1, *The Tank and Mechanized Infantry Company Team (Final Draft)* (1982)<sup>23</sup> and TT 71-1/2, *Division 86 Vol.II (Company & Platoon (Draft))* (1982). These two manuals contained detailed explanations and diagrams for warfare conducted by armored vehicles in the MOUT environment.<sup>24</sup>

Interestingly, these manuals, in approved editions, dropped those sections pertaining to armor roll in the MOUT environment.<sup>25</sup> This continued a general trend other authors have noted. US MOUT doctrine reflects the gradual surrendering of the MOUT battlefield and doctrinal discussion to the exclusive preview of the infantry.<sup>26</sup>

Predictably 1980’s MOUT doctrine dropped the combined arms principle. This permitted out of balanced concepts such as the *Peace Enforcement Operations at Brigade and Battalion*, White Paper. In this white paper from the United States Infantry School, there exists several dichotic aspects. The paper first develops a concept where “Infantry, Armor, and Combat Aviation will play major roles in coercing belligerents.”<sup>27</sup>

Contrast that concept with a brigade task organization; a requirement for a unit described as a “heavy team” consists of a headquarters, a tank platoon, and attached mechanized infantry platoons.<sup>28</sup> How major a role can a single armor platoon play? Would this result in partitioning a tank per infantry battalion? Later, the document

envisioned "the introduction of Mechanized Infantry and Armored forces (sic) provides a quantum leap in combat power over equivalent sized light forces."<sup>29</sup>

Authors made much hay regarding the recent United States operation against Panama. Known as Operation Just Cause, planners used this very doctrine to reinforce the light forces. However, the use of light armor against a building with no anti-armor threat is truly an aberration. It would certainly be a fatal path to believe armor's future roll will remain at the platoon or lower levels.

The disjuncture in this doctrine occurs in the Maneuver and Fire Support sections. The White Paper calls for a mobile reserve, not based on the survivable tank, but on the "HMMWV TOW carrier using . . . the M2 and M60 machine guns or MK 19, 40mm grenade machine gun."<sup>30</sup> Fire support is provided by "mortars, artillery, and attack helicopters" with armor relegated to operations on the outskirts of the city.<sup>31</sup>

Several authors correctly summarized that the 1980's and early 90's MOUT doctrine was void of complete armor concepts. Infantry will carry the burden, as FM 71-123 observed, "The MOUT fight is predominantly an infantry fight."<sup>32</sup> Tank employment doctrine was practically nonexistent, offering little help to the lieutenant, captain, or even lieutenant colonel.<sup>33</sup>

### **Base Doctrine Summary**

In summary, MOUT operations include those actions apart from the urban area designed to isolate the enemy. They also include operations to gain a foothold on the edge of city, the fight in a city, and the fight through the city to the enemy's rear. In the

modern military era the entire spectrum of weapons and forces have participated in the MOUT struggle. However it still remains the dismounted infantry soldier's domain. This is the man who bears the heaviest burden in urban combat, after the civilian population.

The opening paragraph of U.S. Army's FM 90-10 provides a sober warning "tactically doctrine stresses that urban combat operations are conducted only when required and that built-up areas are isolated and bypassed rather than risking a costly, time consuming operation in this difficult environment."<sup>34</sup> (Emphasis part of the original statement)

Certainly, the costs, hardships, and intensity have historically been high in urban warfare. Armor leaders train tank forces to bypass and isolate strongpoints, but as William Betson observed, this led to "Virtually no tank units practicing techniques of city fighting."<sup>35</sup> In defiance of the tank's vulnerabilities and unique urban restrictions, the combined arms approach has proven the most effective formula to victory.<sup>36</sup>

### **The United States Marine Corps**

Another source of MOUT doctrine is the Marine Corps forming the other land force component of power projection. Certainly recent historical trends, 2d Armored Division's Tiger Brigade reinforcing 2d Marine Division during Desert Storm, and our national military strategy stressing joint operations reinforces the wisdom of looking at the Corps' views. Marine doctrine for the use of armor in MOUT found mainly in their



infantry manuals: Fleet Marine Force Manual (FMFM) 6-3, *Marine Infantry Battalion*, FMFM 6-4, *Marine Rifle Company Platoon*, and in FMFM 9-1, *Tank Employment/Counter-mechanized Operations*. Operational Handbook (OH) 8-7, *Military Operations on Urbanized Terrain*, provides an excellent resource on how to fight in various urban operations.

This doctrinal manual is superior to the Army's FM 90-10, *Military Operations on Urbanized Terrain*, written in the same time frame. It addresses concepts on how to fight in any urban environment and provides greater detail for using armor. Generally, the manual has a simpler and more logical organization than FM 90-10 but maintains identical broader concepts found in FM 90-10.

The bottom line is Marine tactical doctrine visualizes using tanks in MOUT battles like the Army's comparable tactical doctrine. They foresee tanks fighting as part of a combined-arms force "since their firepower, mobility, and shock effect are somewhat reduced when operating in the urban environment."<sup>37</sup> Like the Army, Marine tankers will follow the infantry providing mutual support. "The tank will never be used as the lead element of an assault."<sup>38</sup>

Current Marine doctrine calls for combined weapons effects with tank crews "expected to fight in urban environments as an integral part of the air-ground team."<sup>39</sup> Nevertheless, as with Army doctrine, Marines do not envision armor units operating independent in MOUT Operations. Perhaps the greatest doctrinal difference found in the Marine doctrine is a willingness to break armor units down to tank sections supporting the infantry platoon.<sup>40</sup>

## United States Army MOUT Doctrine

### **Corps and Division**

Any look for the tactical level of MOUT doctrine should begin at the Corps and Division level. Both levels of organization recently distributed new doctrine: June 1996 for *Corps Operations*, FM 100-15 and October 1995 for *Division Operations*, FM 71-100. The purpose was to set forth the doctrinal principles which apply to each organization regarding the capabilities, limitations, and employment. There is no MOUT specific doctrine in either because specific tactics, techniques, or procedures (TTP) exist in supporting manuals such as FM 71-100-2, *Infantry Division Operations: Tactics, Techniques, and Procedures*.<sup>41</sup>

FM 71-100-2, issued in August 1993, provides a "how to" guide by describing the tactics and techniques for conducting division combat operations.<sup>42</sup> Chapter 8, *Environmental Considerations*, contains a detailed 10-page section dedicated to division doctrine for warfare on urban territory (MOUT). It exhorts the division commander and his staff to understand the complexities associated with MOUT battlefield, but offers an early erroneous premise.

The author of this manual implies, "Doctrine applicable to the open battlefield is equally applicable to the urban battlefield. . . . only the factors of METT-T change."<sup>43</sup> This is wrong. Why would one find doctrine specific only to urban warfare if this was so? Fortunately, the author immediately contradicts this axiom by highlighting the unique aspects of urban battle, such as isolation and the need for specialized doctrine.<sup>44</sup>

The purpose of this section is to provide a summary of MOUT TTP at the division-level while directing battalion and lower level requirements to the doctrinal reference of FMs 90-10 and 90-10-1.

Germane to this paper is what the doctrine has to say regarding using armor to develop effective task organization for MOUT. Concepts advanced in the defense include the division "augmented with armored forces, may opt to use them as a mobile counterattack force . . . or as part of a blocking force on a major avenue of approach."<sup>45</sup> A detailed discussion of tank capabilities develops after reminding the infantry commander of the unsuitability of his TOW and Dragon antitank systems in city battles. These weapons are limited by the few available positions needed to achieve a 65-meter minimum arming distance.

Tanks and BFVs (Bradley Fighting Vehicles) can be extremely effective in the city in supporting both offensive and defensive operations. Tank main guns generally do not make good entry-point holes in buildings, but can prove effective when fired at point targets. High-explosive ammunition should be used in most cases. Tanks can destroy steeples, tall chimneys, and other structures containing enemy artillery observers. The tank's greatest value may be its mobile machine gun support to maneuvering infantry. With two 7.62-millimeter and one .50 caliber machine guns, two tanks have the mobile machine gun firepower of an infantry company.<sup>46</sup>

While correctly cautioning conducting operations in built-up areas as a last resort, this doctrine envisions always employing tanks in a combined arms effort to maximize capabilities and minimizes vulnerabilities. *Infantry Division Operations* developed four basic tenants for using armor in urban warfare:

- In the attack use tanks to reinforce an infantry-heavy assault force.
- In the attack use a tank-heavy enveloping force:
  - ⇒ Preventing the enemy's escape.
  - ⇒ Preventing reinforcement of the city.
  - ⇒ Provide direct fire support to the infantry assault.
  - ⇒ Protect against enemy counterattacks.
- In the defense employ a combined arms force with tanks to maximize weapons capabilities.
- In the defense maintain a strong armored reserve to counterattack and eliminate penetrations.<sup>47</sup>

### ***Summary of Corps and Division Doctrine***

FM 71-100-2, the highest level 'how to fight' MOUT doctrine, is sufficient in its treatment for integrating armor into the urban battlefield. In a nesting concept for doctrinal development the next level to expect a refinement of MOUT doctrine is the brigade. There is no MOUT doctrine in the new corps-level manual.

### **Brigade, Battalion, & Company MOUT Doctrine**

#### ***Brigade-Level***

*The Armored and Mechanized Infantry Brigade*, FM 71-3, issued in January 1996 provides the next step in armor MOUT doctrine. It attempts to describe the full spectrum of operations. Unlike FM 71-100, the purpose of this manual is to set forth not only the

doctrinal principles regarding the brigade's capabilities, limitations, and employment, but also specific tactics, techniques, or procedures (TTP).<sup>48</sup>

Unfortunately, the result is no armor MOUT specific doctrine. Instead, ambiguous comments only allude to urban warfare; such as "Light infantry is used in close or restrictive terrain" found in Appendix C, *Armored Operations with Light Infantry*.<sup>49</sup> This appendix is merely a summarized version of FM 71-100-2. A review of sources used in writing this manual reveal neither FM 90-10, *Military Operations on Urbanized Terrain (MOUT)*, nor FM 90-10-1, *An Infantryman's Guide to Combat in Built-up Areas* were consulted.<sup>50</sup>

Although representing itself as the source of a brigade TTPs it fails a brigade commander by not discussing the use of his tanks on the urban battlefield. Also the authors failed to reference FM 71-123, *Tactics and Techniques for Combined Arms Heavy Forces*. This is a critical reference addressing the "how to" by attempting to supplement the 71-series manuals with proven tactics and techniques.

### ***Battalion-Level***

FM 71-123, published in September 1992 combined with FM 71-2, *The Tank and Mechanized Infantry Battalion Task Force* updated in August 1994, provide the armor battalion commander with the basic doctrinal concepts for MOUT operations. This monograph differs from earlier authors who found the battalion-level MOUT doctrine of the late 1980's purely defensive oriented and the exclusive domain of the light infantry.<sup>51</sup> David Hain correctly observed the 1988 version of FM 71-2 envisioned "that tanks and

Bradleys maneuver outside . . . while dismounted infantry operates in the urban areas. This is keeping with the basic idea that armored vehicles should not locate in nor fight from built-up areas.”<sup>52</sup>

The updated version of FM 71-2 changed this paradigm through the addition of Appendix A, *Mechanized Infantry and Armored, Light Infantry, and Special Operations Forces Operations*. Section IV of Appendix A develops MOUT doctrine for heavy forces. It covers the full range of military options for urban warfare from offensive to defensive operations.

Offensively, armor MOUT doctrine foresees supporting the infantry by: first, isolating the area and city; secondly, seizing a foothold in the city; finally, clearing the objective. In this final phase a commander is cautioned to never move ahead of the infantry but rather provides fire support.<sup>53</sup> Specific actions called for by the armored battalion include:

- Firing into upper floors of buildings forcing the enemy to lower levels, where the infantry can trap and destroy him.
- Suppressing and destroying enemy weapons and personnel, allowing infantry to maneuver.
- Protecting tanks and other antitank systems.
- Creating openings in building and destroying bunkers to permit infantry assaults.<sup>54</sup>

Defensively, MOUT doctrine uses a combined arms effort: first, fighting forward of the city to delay the enemy; secondly, engagement at the perimeter of the city; finally, battle within the built-up area. In this final phase an armor commander may conduct counterattacks or reinforce strongpoints.<sup>55</sup>

FM 71-2 is the first place doctrine considers the employment of single tanks for direct-fire support of the infantry, but favors armored vehicles operating in pairs. Finally, the armor battalion commander is referred to FM 90-10-1 for additional doctrine for conducting MOUT battle at lower echelons.

FM 71-123 was designed to “flesh out” the 71-series by reflecting on the way heavy forces fight. It uses a three-phased approach to various missions; reinforcing to the commander and staff the importance of planning, preparation, and execution. This manual closely parallels FM 71-2’s MOUT doctrine in the last section of Appendix B, *Light/Heavy Forces Attacking in MOUT*.

As the title implied this section only considers MOUT offensive operations. In its four short pages one-quarter is dedicated to METT-T considerations peculiar to MOUT battles involving armor C<sup>2</sup> difficulties and the tank’s limitations. Tank tasks found in the combined arms section parallel FM 71-2 with the addition of “Tanks provide protection to infantry from enemy small arms and fragmentation.”<sup>56</sup> The listed procedures for conducting attacks match FM 71-2’s three-phased approach to offensive MOUT missions. Finally a short discussion of tank platoon or section techniques on combat with an infantry platoon on the streets.

### ***Summary of Brigade, Battalion, & Company Doctrine***

Brigade doctrine falls short in all of its MOUT considerations, especially in its treatment of armor. The battalion-level doctrine provides the basic doctrinal considerations and points the infantry leader to MOUT specific 'how to fight' manuals. However, there is no armor equivalent to recommend to a tank battalion commander. Tank Company doctrine, developed in FM 71-1 during the mid-1980s, provides the company commander with seven pages of offensive and defensive TTPs for the urban fight. Though this manual is old, it still expands the concepts and principles found in the newer battalion doctrine.

### **Platoon MOUT Doctrine**

Under the nested concept of doctrinal development we should expect the specific "how to fight" Armor MOUT concepts expanded in FM 17-15, *Tank Platoon*.

This manual, distributed to the armor force in April 1996, represents the latest doctrine describing how the tank platoon fights. The focus is platoon operations to include the latest TTPs required to bring combat power to bear. One intended purpose is to "examine alternate (sic) considerations and techniques for their use."<sup>57</sup>

Unfortunately, in reality FM 17-15 fails to provide those most likely to fight the MOUT battle with any useful TTPs. The manual only describes the limitations of tanks and their vulnerable to dismounted in built-up areas.<sup>58</sup> In Chapter 3, *Offensive Operations*, restrictive terrain doctrine, such as urban areas, prescribes for a tank section attacking only when overwatched by another section or dismounted infantry.<sup>59</sup> Later,



Chapter 5, *Other Operations*, encourages platoon leaders to avoid man-made obstacles “such as towns, cities, or railroad embankments.”<sup>60</sup>

Light/Heavy operations, described in Appendix B, open with the plain-spoken comment, “Tanks never fight alone.” The armor leader is to remember “restrictive terrain (such as built-up areas) increases the vulnerability of armor. Tanks take a supporting role in the forward movement of the infantry. Armor provides close-in direct fire support against hard and soft targets that slow the infantry’s advance.”<sup>61</sup>

Further on, the armor leader discovers an inaccurate prevailing point; “the platoon is the lowest level at which the armor leader must be trained to interact with a controlling headquarters.”<sup>62</sup> However, in World War Two virtually every MOUT battle involving armor, saw tanks deployed at levels below platoon strength. Other doctrinal manuals, covered in this monograph envisioned section deployments as acceptable.

The *Tank Platoon* completes its discussion, neither mentions MOUT specifically nor details the platoon leader’s role in the urban fight. He has the responsibility to understand his tanks’ capabilities and limitations for urban warfare. Considering this knowledge, he then can aid the infantry commander in formulating a plan with armor support.<sup>63</sup>

### ***Summary of Tank Platoon Doctrine***

Like its predecessor, FM 17-15 (1996), *Tank Platoon*, fails once again to develop armor MOUT doctrine. The primary doctrinal manual for the small unit armor leader will not provide a comprehensive tactical understanding for employing tanks in MOUT

environment. The manual argues for combined arms action and advocates avoiding the urban fight in the first place.

### **FM 90-10-1 MOUT's How to Fight Manual**

FM 90-10-1, *An Infantryman's Guide to Combat in Built-up Areas*, as the name implies, is infantry oriented. It provides the infantry with guidelines and techniques for fighting an organized enemy in urban areas.<sup>64</sup> Quickly establishing a new paradigm for future war, the writer's envision an Eurasian continental battlefield as the domain of the urban warrior, leading the authors' to state emphatically, "This type of combat cannot be avoided."<sup>65</sup>

The doctrinal focus is on infantry units from battalion down to squad level fighting with a combined arms approaches. A deliberate attack consists of five actions.

- Reconnoiter the Objective.
- Move to the Objective. Tanks:
  - ⇒ Provide security to the force from overwatch positions.
  - ⇒ Provide enhanced mobility by breaching obstacles and defeating enemy forward outposts.
- Isolate the Objective. Tanks:
  - ⇒ Prevent the enemy's escape.
  - ⇒ Prevent reinforcement of the city.
  - ⇒ Provide direct fire support to the infantry assault.

- Secure a Foothold.
- Clear the Built-up Area. Tanks fighting dispersed in direct support of dismounted attacks.

Less MOUT specific defensive structure exists in FM 90-10-1, featuring a traditional area defensive structure:

- Security Operations.
- Main Battle Area on the forward edges of the city.
- Rear Area consisting of either the city's center or the supply and maintenance support area.

The battalion's attached tanks are reserved for enemy armor and covering obstacles with long range fires. The commander should employ his tanks in platoon packages where possible and maintain a strong armored reserve to counterattack and eliminate penetrations.

This manual's proponent, the US Army Infantry School, updated it October 1995 by adding Appendix N, *Infantry and Armor Small-Unit Actions during MOUT*. Intended to assist the foot soldier, the four page supplement expands on what tanks can and cannot add to the spectrum of combat action in urban areas. Unlike the earlier chapters, Appendix N will not provide MOUT TTPs for tankers.

Instead, the combined arms task organization attaches a tank platoon to an infantry company, with the platoon broken into two-tank sections for each of the lead rifle platoons. The technique of employment calls for the dismounted platoon to lead through the built-up area locating and identifying targets for the tanks to engage. The tanks, following by close bounding overwatch positions contributing supportive fires to fix the enemy or destroy him.<sup>66</sup>

### **MOUT Doctrine Summary**

Analyses of all the United States military doctrine for MOUT and armor specific MOUT principles, almost entirely rewritten in the 1990's brings the following conclusions:

- MOUT Doctrine is well-nested beginning at the division-level down to the individual foot soldier. The exception is brigade-level MOUT doctrine.
- MOUT Doctrine calls for using light infantry forces in built-up areas, task organized with armor to bring a combined arms effect.
- MOUT doctrine provides techniques on how to employ tanks in both offensive and defensive operations.
- Armor MOUT doctrine for TTPs at platoon and crew-level does not exist.

Having determined the state of American MOUT doctrine, the next logical step is posing a question; "Can the perceived shortcomings impact on our ability in the future to

conduct urban operations?" It is prudent to study past MOUT battles in an attempt to draw consistent themes and validate current doctrine. Finally, our observations of armor's past roles will allow us to estimate America's preparedness for conducting MOUT using tanks as the means to bring a combined arms effect to bear.

### **III -- HISTORICAL PERSPECTIVES**

Historical analysis methodology for studying doctrinal and theoretical issues has proven itself; whether it be Clausewitz's study of Frederick and Napoleon or our modern quest for understanding operational art through studying German "Blitzkrieg" tactics. This is also true for understanding MOUT doctrine and the role of tanks in it.

Most professional papers on this topic tend to center on four historical battles: The Battle of Aachen -- 1944, The Battle of Berlin -- 1945, Hue -- 1968, and Suez City -- 1973. Each is worthy of study because it reveals the source of current American MOUT doctrine or demonstrates the cost using poor doctrine. Perhaps even more germane to our study was the impact of technological advancement of the weapons found on the MOUT battlefield. Such technological advancements ultimately led to the exclusion of armor from MOUT operations for nearly twenty years. This monograph will review each operation to provide a historic background focused at the tactical level of urban warfare.

#### **The Battle of Aachen, Germany**

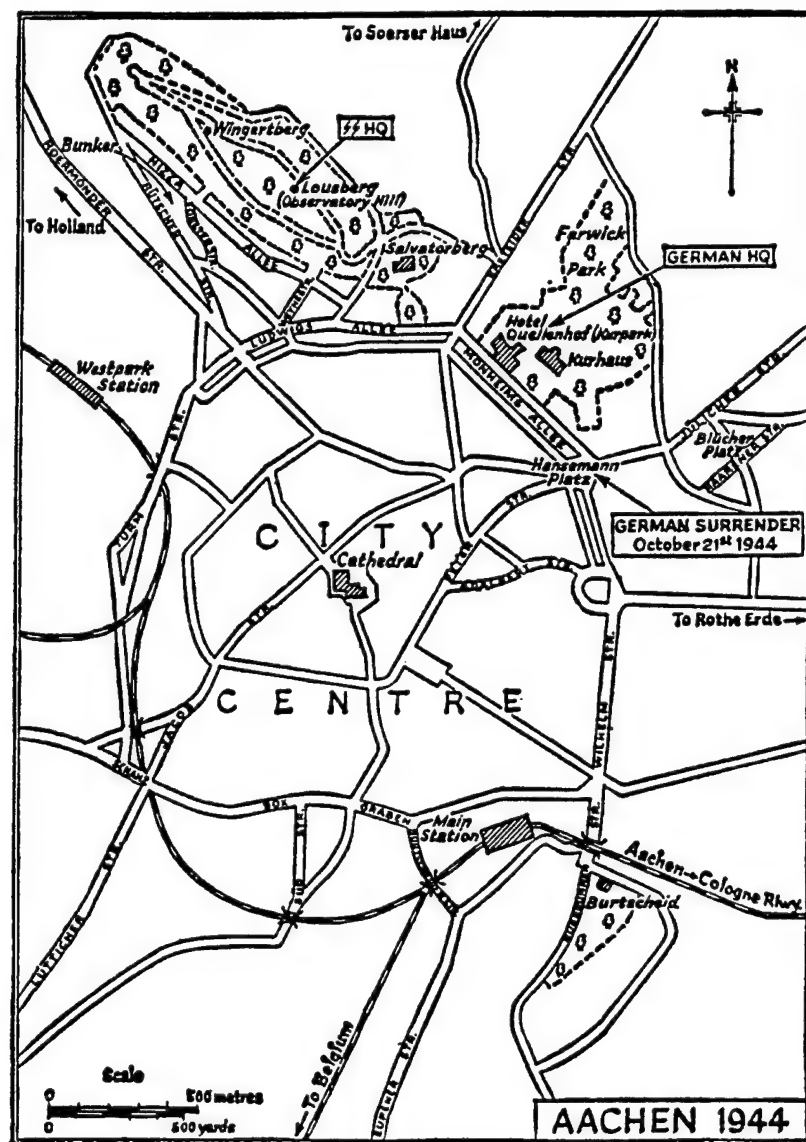
Aachen, located in the northern Rhineland, with a pre-war population of 165,000 was of considerable importance to the Allies. In October 1944, no German city had yet

fallen to the Allies' advance. LTG Hodges assigned the task of besieging the first German city ever attacked by Americans to the 1st Infantry Division--The Big Red One.

Charlemagne's ancient city had stood for more than 1,000 years as the symbol of German nationalism. Hitler and the German General Staff desperately needed the garrison at Aachen to stop the American advance in the area. The Fuhrer needed time to assemble forces for his last western offensive of the war. Already his forces were moving into the Eifel's fir forests less than twenty miles from Aachen.<sup>67</sup> The Wehrmacht turned to Colonel Gerhardt Wilck who commanded the 5,000 man strong 246th Volksgrenadier Division augmented by 5 tanks in city's defense for this formidable task of halting the advance of the US First Army.<sup>68</sup>

The 26th Infantry Regiment received the task of conducting a careful reconnaissance of the city determining the German defenses' orientation to the South and West. LTC Derrill M. Daniel organized his battalion into combined arms assault teams. Each team consisted of one rifle company, one tank platoon, and reinforced by a self-propelled 155mm artillery gun.<sup>69</sup>

The city was first isolated and then a combined arms attack quickly seized a foothold in the East. Daniel's plan called for isolation of a city block followed by platoons attacking down streets synchronized by checkpoints. Buildings and strongpoints fell quickly, destroyed by direct fire from tanks and 155mm guns. LTC Daniel wrote of the effects, "The firing of the 155mm gun in the direct fire role was quite spectacular and satisfying from our viewpoint."<sup>70</sup>



Map 1. America's offensive at Aachen, Germany October 1944<sup>71</sup>

COL Wilck ultimately surrendered the city; his command post, a massive building in the city center being pierced from end to end by 155mm Long Tom rifles firing at less than 200 yards of the building. He later gave General Eisenhower the rueful observation, "When the Americans start using 155s as sniper weapons, it is time to give up."<sup>72</sup>

Aachen also remains vital for its impact on the Allied drive across Germany. The battle for the first German city had lasted six weeks and costs the First Army over 8,000 casualties and 200 tanks. First Army's drive through the Hurtgen Forest, to force Aachen's flank, ultimately culminated the American offensive for four months.<sup>73</sup> More importantly the six week battle allowed the German build-up to remain undetected. Two Months later, on 16 December 1944, the Germans advanced West beginning the Battle of the Bulge. This ultimately costs the Americans 80,000 casualties and delayed the Allied victory over Germany by six months.<sup>74</sup>

### **The Battle's Impact on Future MOUT Operations**

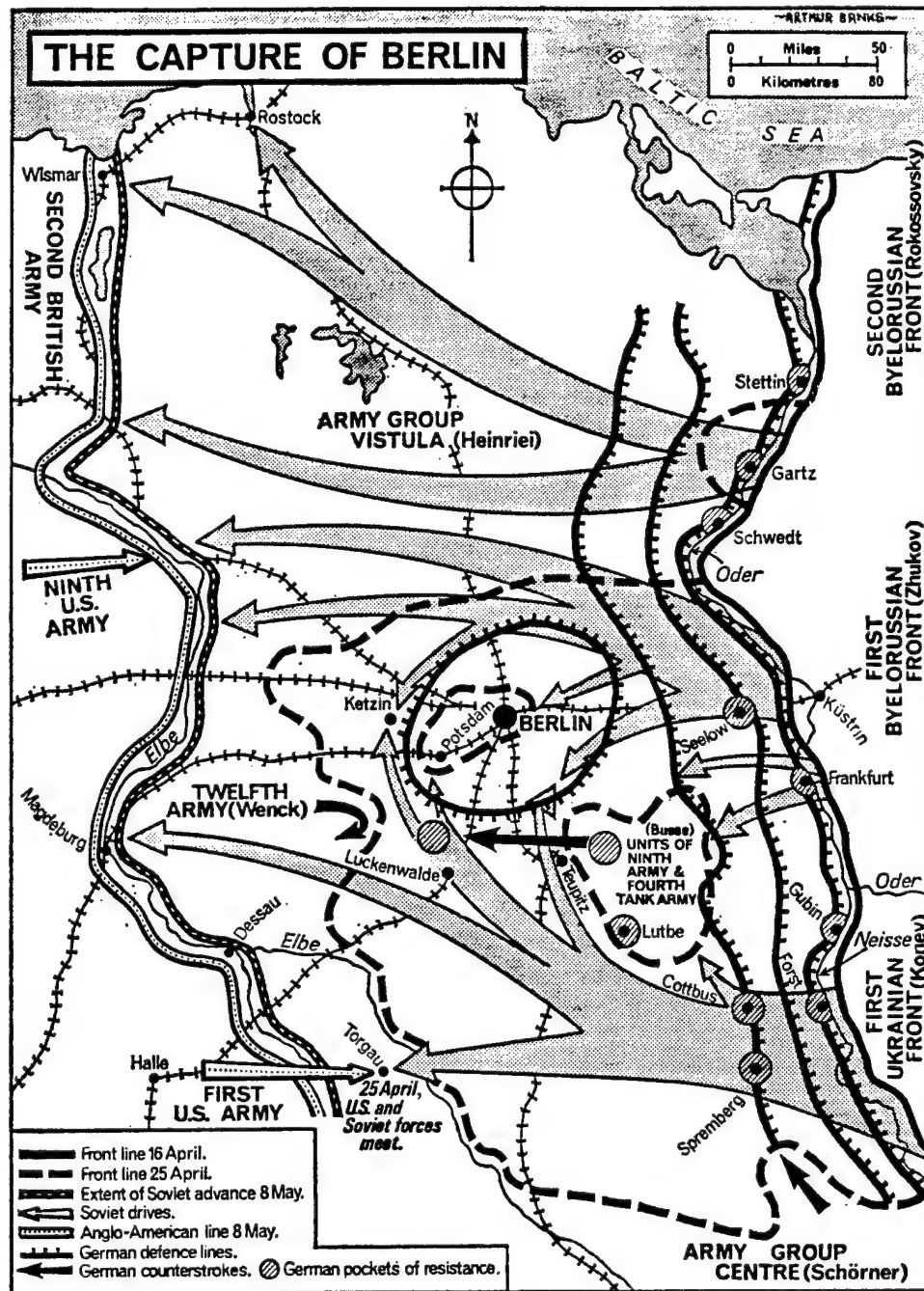
Aachen remains significant because the lessons we learned became the embodiment of our current MOUT doctrine. All of the offensive and defensive underlying principles associated with sound MOUT doctrine reveal themselves in a careful study of this battle. FM 90-10 contains the same principles: Reconnoiter the Objective, Isolate the City, Secure a Foothold, Clear the Built-up Area. Finally, Aachen clearly demonstrated the fundamental tenet for armor MOUT -- tanks fight dispersed in direct support of dismounted infantry attacks.

### **The Battle of Berlin, Germany**

The final Russian assault of Berlin provides additional perspectives on the scope of MOUT operations may take. The Soviet Forces used in this battle included four entire tank armies with over 6,250 tanks eventually participating in the fight. An estimated 2,500,000 men were involved in the final assault of Berlin.<sup>75</sup> The Soviet opponents



consisted of the defeated remnants of the Wehrmacht, reinforced by old men, women and young boys.



Map 2. Soviet capture of Berlin, Germany April 1945<sup>76</sup>

The Soviet plan, developed by Marshal G. K. Zhukov called for the tanks reinforced with artillery to simply overrun the meager German forces guarding Berlin.<sup>77</sup> This repeated earlier Soviet patterns, which by 1943 became doctrine, of taking smaller cities from the march by forward deployed tank brigades. In the suburbs of Berlin, this doctrine failed completely as Soviet tank units could not penetrate the fierce German resistance. One Soviet tank corps commander, Army General A. L. Getman observed, "From the first day to the last day of Berlin fighting, tank units were unable to effect separation from the enemy." Getman later commented his losses in tanks and field artillery were even heavy in the suburbs.<sup>78</sup> The battle for the Reichstag building alone cost the Third Shock Army over 2,000 lives. Overall, the Soviet losses in the 17 day urban battle amounted to over 300,000 casualties. German casualties not exactly known, but estimates run at least twice the Soviet numbers.<sup>79</sup>

### **The Battle's Impact on Future MOUT Operations**

The Soviet assessment of their World War II experience, rejected the use of independent tank armies in the city.

Notwithstanding this doctrinal standard, there existed an opposite view by many Soviet generals. They point to the actions of Army General Tolubko during World War Two. He led the successful assault of Belgrade and Koenigsberg using Soviet heavy tank forces reinforced with air superiority, but with very little infantry support, to quickly capture both in mere days.<sup>80</sup> However he did not face a determined foe in either of these battles.

The Soviet indecision on the best approach to take for offensive MOUT battles carries over to the modern Russian Army. Recent unsuccessful Russian actions against Grozny's Chechen rebels occurred in part because of poor MOUT doctrine. Russian field commanders using some of their most modern equipment charged into the city with tanks leading followed by mechanized infantry unsupported by dismounted troops. The battle for Berlin should have taught modern Russian commanders to never commit armor to the urban battlefield without dismounted infantry support.

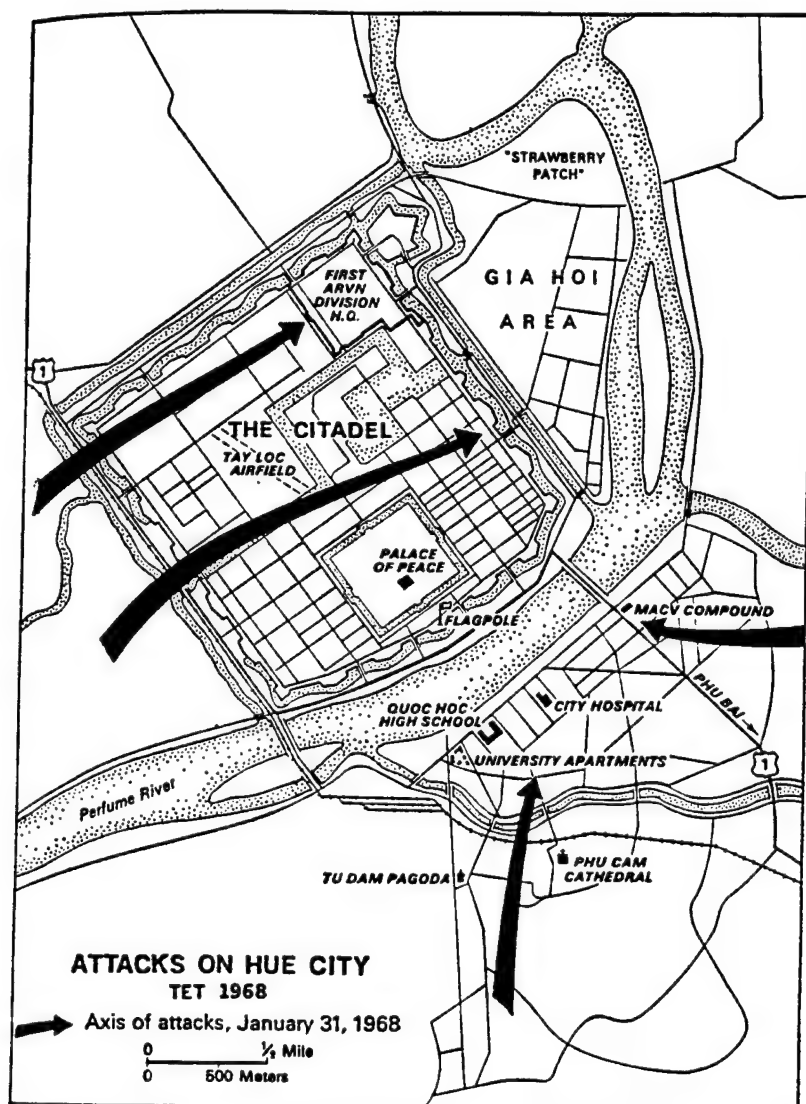
The lesson for future MOUT tactical planners is to "Employ tanks in small groups and in close interaction with other services, especially with infantry."<sup>81</sup> This was the doctrinal view of the Soviet military towards the end of World War Two. However, the Operational-level Commander's disregard of correct tactical doctrine cost him unnecessary losses and delayed the victory.

### **The Battle of Hue, Vietnam**

This urban battle, considered by many as the most bitter of the Vietnam war, began on 31 January 1968 and lasted 27 days. Many important MOUT lessons were drawn from this battle to include the future roll of armor in MOUT. The Marine Corps found the use of M-48A1 Patton tanks and ONTOS (small tracked vehicle mounting six 106mm recoilless rifles) supporting infantry companies by bringing responsive and overwhelming very useful. Early in the battle a lack of MOUT training in the Marine Corps led to mistakes including sending tanks forward without infantry support. The results are predictable with each tank in one battalion sustaining ten to twelve RPG

(Rocket Propelled Grenade) each. Later with a combined arms approach the same battalion sustained no damage from RPGs.<sup>82</sup>

Armor received high marks from each of the Marine battalion commanders. LtCol Gravel's favored technique was to use tanks to plow new streets through buildings and walled compounds; "The method destroyed a lot of Hue, but it saved lives."<sup>83</sup> Major Thompson, commander of 1/5 Marine, considered his tanks his most important asset.<sup>84</sup>



The battle did show many weaknesses however; chief among them was the failure to isolate the city, caused by using only dismounted troops. This allowed North Vietnamese commanders to resupply the city by way of a corridor along the Perfume River. Secondly, as LtCol Harrington notes, the marines last MOUT experience was Seoul, Korea "Our experience level at the time (HUE) was absolutely zero. Initially as we went in we did not have any real concept of how we were supposed to fight."<sup>86</sup>

### **The Battle's Impact on Future MOUT Operations**

American commanders took away incorrect lessons from Hue. Unquestionably, these lessons have lost their validity for today's military planners and should have been questioned at the time. First, tanks used at Hue appeared to suffer heavily from the RPG threat. Secondly, the Marines used correct MOUT doctrine, yet their tank losses remained unacceptable. Thus the conclusion was drawn; 'do not consider using tanks in the urban fight.'

However, a closer look clearly shows the Marine commanders quickly adapted to their unfamiliar environment. Initially, commanders, who had no MOUT training experience made mistakes. Marine commanders, by changing their MOUT tactics, used tanks in support of light infantry advances dramatically decreasing tank losses. Further, they isolated the city by using tanks and infantry patrols on the perimeter. Finally, those tanks struck with RPG rounds seldom were permanently disabled and often returned to duty the same day.

In light of the survivability provided to modern tanks equipped with special armor packages combined with correct MOUT doctrine; the lessons of Hue should focus on the positive aspects of quickly adaptive organizational structure and the combat power of offered by bring a combined arms effect on the urban battlefield.

### **The Battle of Suez City, Egypt**

The Battle of Suez City occurred in the closing days of the October 1973 Mideast War, often referred to as the Yom Kippur War. Israeli forces, having crossed the Suez Canal, were seeking to complete the encirclement of the Egyptian Third Army trapped on the east bank. Time was critical because the United Nations Truce Supervisory Organization (UNTSO) observers were en route to implement the cease fire agreement.<sup>87</sup>

Suez City was evacuated prior to the war except for a trained militia. Brigadier Yussif Afifi reinforced the detachment with regular Egyptian forces from the 19th Infantry Division. These combat hardened soldiers were formed into tank-killer teams to defend the city from the predicted Israeli armored assault.<sup>88</sup> The defense consisted of two mechanized infantry battalions reinforced with an antitank company and tank company. Israelis committed two armored brigades without organic infantry, but reinforced with two companies of paratroopers.<sup>89</sup>

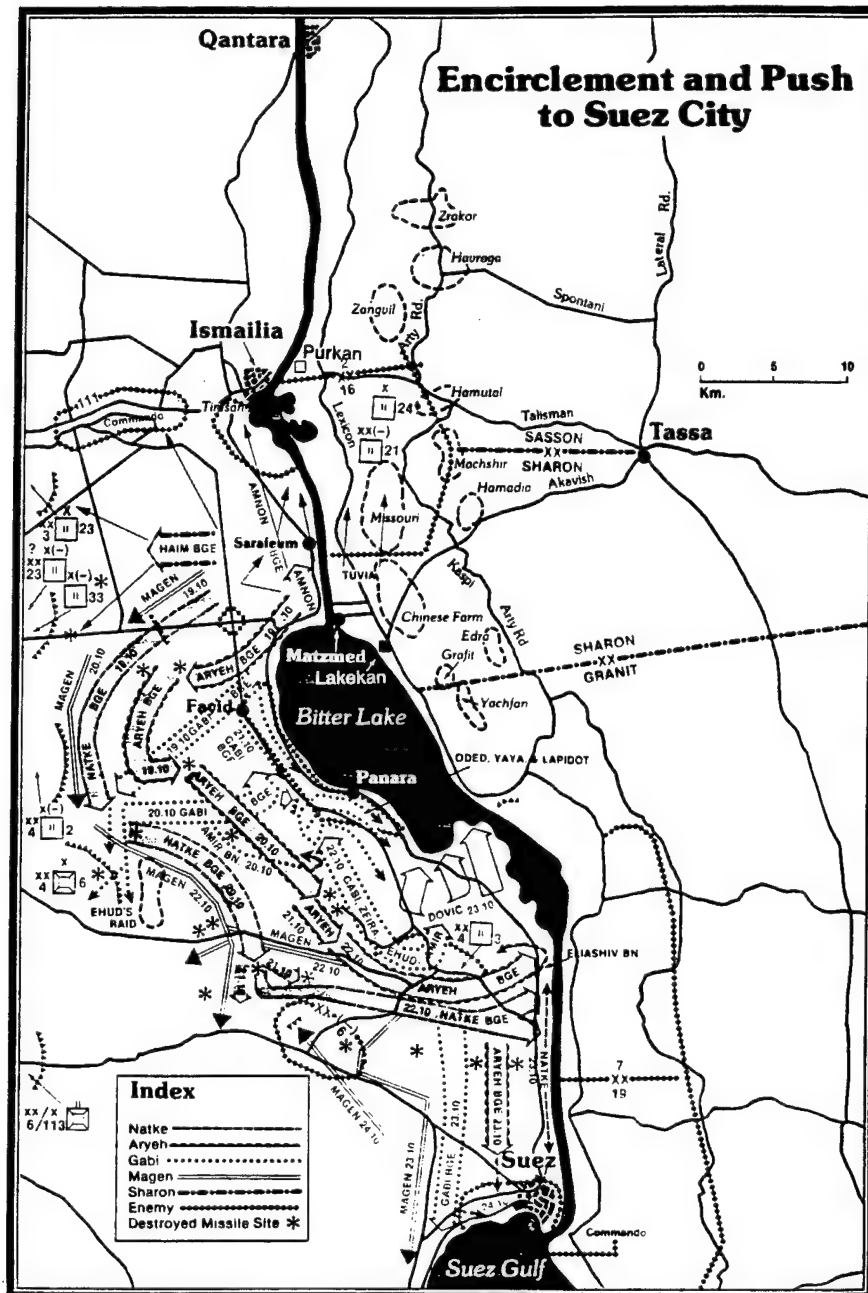
The Israelis, with only six hours before arrival of UNTSO, developed a simple plan. The strategy was consistent with previous Israeli MOUT tactics. These tactics were proven successful in earlier Israeli urban battles such as Gaza 1956, and at Nablus, Ramallah, and Jenin in 1967.<sup>90</sup> Israeli MOUT doctrine at the time, similar to earlier

Soviet doctrine, called for tanks and APCs to use mounted shock tactics to penetrate defenses and seize decisive points in a city.<sup>91</sup> Soviet Front Commander's (Marshal Zhukov's) attack order at Berlin, leading with tank armies represents a classic example of the desired effect. Marshal of the Soviet Union M. V. Zakharov later wrote of the tactics "Soviet forces were under orders to advance so rapidly that they could seize and hold population centers before enemy forces could retreat into the town and take up defense positions there."<sup>92</sup>

The plan called for one brigade encircling the city to isolate it. The other armored brigade, commanded by Colonel Aryeh, reinforced by air strikes and artillery fires would conduct a mounted assault into the city. Aryeh broke his brigade down into two tank columns. Each column led with tanks rapidly advanced down one of the two main avenues of Suez City. Paratroopers followed behind mounted in APCs and half-tracks to mop up any bypassed resistance.

The attack on the morning of 24 October quickly bogged down in the northern edge of the city. The antitank gun fires from the Egyptians consisted of tank cannon, Sagger missiles, ZU-23 AA guns, RPGs, and snipers. So devastating were the combined effects of these weapons that every tank commander in one Israeli battalion was either killed or wounded.<sup>93</sup>

Although the Israelis did manage to capture each decisive point in the city they had culminated offensively and could not consolidate their gains. The remnants of the 217th Armored Brigade were forced to retreat that night under the cover of darkness.



Map 4. Israeli attack against Suez City, October 1973<sup>94</sup>

## The Battle's Impact on Future MOUT Operations

The experience represents one of the most humiliating failures in Israeli modern history and the only post-World War II battle where an attacker with armor superiority



failed to capture the city he attacked.<sup>95</sup> Analysis reveals there were three main factors that led to this stunning defeat.

First, tactical commanders at brigade-level received erroneous intelligence. The commanders did not know of the existence of the new ATGM Sagger system. The extensive defensive preparations of the city by the Egyptians completely surprised General Adan.

Secondly, Israeli doctrine had failed. Using armor's shock effect through rapid advance unimpeded by supporting infantry simply did not work against prepared and professional soldiers. Earlier successes led to an over reliance on armor capabilities and a disregard of combined-arms tactics in MOUT. Israeli historical studies of Soviet World War II MOUT experiences had apparently failed to consider the other side of the dichotomy in Soviet MOUT experience.

Finally, a paradigm switch occurred in the long competition between armored vehicles and anti-armor systems. Armored vehicle technology had reached its practical extremity for protecting its crews using a cast rolled homogeneous steel armor (RHA). Prior to the introduction of special armors, the maximum level of frontal armor was exemplified by the British Chieftain tank with an RHA factor of 390-mm. The average main battle tanks of the 1970's had frontal armor approaching 250-mm. These significant protection packages however led to diminishing returns with respect to a tank's mobility and agility. Tank survivability decreased as the power-to-weight ratios began to fall, leading to a cap on armor thickness.<sup>96</sup>

Simultaneous to the this climax in cast armor technology came the fielding of a new generation of light infantry anti-tank guided missiles (ATGM). This new family of electronically guided missiles, typified by the Soviet-built AT-3 Sagger, exhibited unparalleled accuracy, range, and lethality. The AT-3 Sagger ATGM systems employed by the Egyptian Army at Suez City easily sliced through even the frontal armor of Israeli tanks. ATGM capability to penetrate up to 400-mm of RHA and low cost relative to the tank appeared as a 'new era' where the defense again was supremacy.

#### **IV -- ANALYSIS AND IMPLICATIONS**

Tactical planners in the mid-1970's saw a new paradigm where the tank no longer participated in the urban fight. To the experts a modern city defender equipped with RPG-7s and reinforced by ATGM tank-killer teams could easily find cover and concealment for their new lethal weapons. The 1973 Yom Kippur War seemed to reinforce the great disadvantage of using tanks on the modern urban battlefield.

The United States Army's view was similar. America's best tank of the period, the M60A1 Patton, was tested. Discouraging results pointed at a forty percent chance of receiving a disabling hit on first shot from a RPG-7 rocket launcher.<sup>97</sup> This weapon had the lowest lethality of the new Soviet anti-tank systems but was nonetheless perfect for the MOUT environment. A tank's lower speed and lack of maneuvering space combined with limited engagement ranges common in cities negated all the disadvantages associated with these new systems.

The ramification of each of these historical case studies confirms MOUT doctrine prediction regarding the cost of fighting on the urban battlefield. They also validate the base tactical doctrine of MOUT "Urban combat operations are conducted only when required . . . built-up areas are isolated and bypassed rather than risking a costly, time-consuming operation in a difficult environment."<sup>98</sup>

The implications of these four battles developed into a reluctance by American military planners to use main battle tanks in MOUT battles. However, our study and analysis brought to light different conclusions.

First, a closer look at Suez City reveals a quiet different perspective. These tank losses were not from a decisive shift in armor verse anti-armor technology race. Rather it was the tactical misuse of Israeli armor that led to the unacceptable losses at Suez. Egyptian 2d Army commander, LTG Shazly described the results of these poor tactics of armor advancing without infantry support:

The enemy has persisted in throwing away the lives of their tank crews. They have assaulted in "penny packet" groupings and their sole tactic remains the cavalry charge. In the last two days the enemy has lost another 260 tanks. Our strategy always has been to force the enemy to fight on our terms; but we never expected them to cooperate.<sup>99</sup>

Secondly, tanks were much more survivable than the pundits indicated, usually suffering no effect or only temporarily disabled. This point was driven home to the Americans at Hue where one Marine Corps M-48A3 Patton tank sustained 121 RPG hits and lost five crews in only one month.<sup>100</sup>

Finally, each of these MOUT battles revealed the only sound doctrine for using tanks in the urban battle was a combined arms effort with dismounted infantry. The interview this author was privileged to conduct with the last surviving WW II armor recipient of the Congressional Medal of Honor, Captain James Burt drives the point home. Burt commanded a tank company assigned to 66th Armored Regiment charged with encircling Aachen to prevent German reinforcements. Captain Burt states, "You simply could not advance through a village without infantry support." He latter recalled, "Grunts couldn't make it without tank support. I spent the majority of my time out of my tank coordinating with the infantry and as a forward observer bring artillery fire on buildings occupied by Germans."<sup>101</sup>

## **V – CONCLUSIONS AND RECOMMENDATIONS**

The purpose of our reflection on current MOUT doctrine for tankers and Armor's role in past MOUT battles was to make recommendations for land force doctrine writers to consider. First the study examined the current MOUT doctrine with an orientation towards the tactical role of main battle tanks in urban warfare. The analysis reveled one familiar theme and two original observations: (1) The base doctrine for MOUT, FM 90-10, as many authors previously observed, needs revision but the underlying principles remain solid. (2) MOUT tactical doctrine is not nested lacking doctrine at the corps, brigade, or tank platoon level. (3) There is no doctrinal equivalent of FM 90-10-1 for fighting heavy armor on the urban battlefield.

Secondly, the study took a retrospective look at Armor's role in four significant urban battles of the past. The urban battles include: The Battle of Aachen -- 1944, the Battle of Berlin -- 1945, Hue -- 1968, and Suez City -- 1973. These battles ranged from army down to platoon-level; focused primarily on the tactical level; where tanks played a significant role.

We then submit the following observations for consideration by the reader. First, MOUT battles historically have involved all organizational sizes. This requires us to revise FM 90-10 and develop MOUT doctrine for every echelon of the US Army. Secondly, the Armor School must develop a "How to Fight" manual along the lines of the infantryman's FM 90-10-1 for tankers and call it FM 90-10-2 *A Tanker's Guide to Combat in Built-up Areas*. Finally, drop the "lesson learned" from our mental model where tanks have no place in the urban fight. Egyptian successes for many critics marked the end of the tank, just as the 16th century technological advances finished the knight in armor. Israeli General Herzog in his book, *The War of Atonement* observed: "Contrary to the hasty conclusions published throughout the world, the tank still remains a dominant factor. . . the antitank missile bore no proportion whatsoever to the publicity accorded it."<sup>102</sup> In fact, they knocked out only 25% of Israel's tanks with ATGM missiles. The end of tanks for urban battles was not at hand, but the technology of the time left the tank more vulnerable. Doctrine needed to adjust by using armor only as part of a combined arms team.<sup>103</sup> The conflicting lessons learned from the October War and the battle at Hue seem to reflect a desire on the part of Israeli and American military leaders to overlook combined arms and MOUT doctrinal failures. In place of

introspective analysis of their actions, the technological superiority of their enemy's weapons systems became the rallying point.

Certainly today there exists merits and liabilities when using modern main battle tanks in the urban environment. This has left many tactical planners wondering if the pendulum of technology has swung back in favor of the tank. The smaller urban conflicts of 80s and 90s involving tanks seem to confirm this paradigm shift from the supremacy of the anti-tank missile to the tank in MOUT environments. Furthermore, the basic doctrinal tenants, first developed during World War II, remain valid in today's urban sprawl.

One can clearly see the likelihood of U.S. forces conducting operations in MOUT environments will continue to increase from previous decades. Now is the time to fix the identified shortfalls in doctrine. Specifically, correct the absence of heavy brigade and tank platoon MOUT doctrine and the inadequacy of TTPs for tankers to prepare for urban warfare. These corrections will allow commanders, at all levels, the ability to train their troops and staffs for this most difficult of all battlefields.

## ENDNOTES

<sup>1</sup>Carl E. Vuono, based on remarks at the Armor Conference, 8 May 1990. "Six Imperatives for the Armor Force," *Armor Magazine*, (July-August 1990) 12-16.

<sup>2</sup>Ibid., 13.

<sup>3</sup>-----, based on remarks at the Armor Conference, 8 May 1991. "Six Imperatives for the Armor Force," *Armor Magazine*, (May-June 1990) 28-32.

<sup>4</sup>Ibid., 31.

<sup>5</sup>Ibid., 31.

<sup>6</sup>Figures come from a wide variety of sources on population growth, including Robert Kaplan's *The Ends of the Earth*, the World Bank, *The New York Times*, and *The Washington Post*.

<sup>7</sup>Robert D. Kaplan, *The Ends of the Earth: A Journey at the Dawn of the 21st Century*, (New York: Random House, 1996), 10.

<sup>8</sup>Ibid., 12.

<sup>9</sup>Michael Dewar, *War in the Streets: The Story of Urban Combat from Calais to Khafji*, (Great Britain: BPCC Hazell Books, 1992), 107.

<sup>10</sup>Chris Bellamy, *The Future of Land Warfare*, (New York: St. Martin's Press, 1987), 136.

<sup>11</sup>Kaplan, 12.

<sup>12</sup>Department of the Army, *Field Manual (FM) 100-5 Operations*, (Washington D.C. GPO June 1993), 14-4.

<sup>13</sup>FM 100-5, iv.

<sup>14</sup> FM 100-5, 14-4.

<sup>15</sup> Department of the Army, *FM 90-10 Military Operations on Urbanized Terrain*, (Washington D.C. GPO August 1979), i.

<sup>16</sup> FM 90-10, 1-2.

<sup>17</sup> Charles A. Preysler, *MOU Art Operational Planning Considerations for MOU*, an unpublished monograph, Fort Leavenworth, KS: School of Advanced Military Studies, US Army Command and General Staff College, 1995, 10-13. Provides an excellent review of FM 90-10 in more detail than necessary for this paper.

<sup>18</sup> *FM 90-10, Military Operations on Urbanized Terrain*, F-2.

<sup>19</sup> *Ibid*, F-2.

<sup>20</sup> Michael J. Dormeyer, *Adequacy of Doctrine for Armor in MOU*, MMAS Thesis, Fort Leavenworth, KS: US Army Command and General Staff College, 1983, 42.

<sup>21</sup> Interview with Captain David Link, Department of Division and Corps Doctrine, Fort Leavenworth, Kansas, September 1996. This department, proponent for the new FM 90-10, currently assigned the task to Lieutenant Colonel Wheimeyer. LTC has not begun work on this manual as other manuals have higher priority.

<sup>22</sup> *FM 90-10, Military Operations on Urbanized Terrain*, ii.

<sup>23</sup> Department of the Army, *FM 71-1 The Tank and Mechanized Infantry Company Team (Final Draft)*, (Washington D.C. GPO August 1983), 6-40 to 6-65. Interesting comparison with FM 71-1, November 1988. This is still the current manual for tank or mechanized company team.

<sup>24</sup> Department of the Army, *TT 71-1/2 The Abrams Battalion Division 86 Vol.II (Company & Platoon (Draft))*, (Washington D.C. GPO August 1982), iv-3-18 to iv-3-34. Portions of this manual survived in FM 71-123, Tactics and Techniques for Combined Arms Heavy Team.

<sup>25</sup> David B. Hain, *Sufficiency of Doctrine for the use of Armor in Military Operations on Urban Terrain*, (Fort Leavenworth, Kansas: United States Army Command and General Staff College -- MMAS, June 1994), 42.

This thesis contains an interesting discussion on the possible reasons why armor MOU doctrine was deleted from the final versions.



<sup>26</sup> Dormeyer and Hain master's theses contain lengthy chapters devoted to this subject.

<sup>27</sup> White Paper by MG Jerry A. White, *The Application of Peace Enforcement Operations at Brigade and Battalion*, (Fort Benning, George: United States Army Infantry School, August 1994), 16.

<sup>28</sup> Ibid., F-1 -- F-2.

<sup>29</sup> Ibid., 17.

<sup>30</sup> Ibid., 19.

<sup>31</sup> Ibid., 17.

<sup>32</sup> Department of the Army, *FM 71-123 Tactics and Techniques for Combined Arms Heavy Forces: Armored Brigade, Battalion Task Force, and Company Team*, (Washington D.C. GPO September 1992), B-22.

<sup>33</sup> Betson, 22.

<sup>34</sup> FM 90-10, 1-1.

<sup>35</sup> William R. Betson, "Tanks and Urban Combat." *Armor Magazine*, (July-August 1992): 22.

<sup>36</sup> James W. O'Connell, *Is the United States Prepared to Conduct Military Operations on Urbanized Terrain?*, (Newport, RI: Naval War College -- Monograph, February 1992), 16.

<sup>37</sup> Department of the Navy, *Fleet Marine Force Manual (FMFM) OH 8-7, Military Operations on Urbanized Terrain*, (Quantico, Virginia: United States Marine Corps, November 1980), 7-6.

<sup>38</sup> *FMFM OH 8-7, 7-6*. Important to note the thesis of David B. Hain, *Sufficiency of Doctrine*, (See Bibliography) provides an excellent review on MOUT doctrine but falls short in Marine doctrine. His comments about tanks leading the attack in MOUT is derived from threat doctrine review.

<sup>39</sup> *FMFM OH 8-7, 7-7*.

<sup>40</sup> *FM 90-10, F-1*. Interesting comparison with *OH 8-7* chapter 7.

<sup>41</sup> Department of the Army, *FM 71-100 Division Operations*, (Washington D.C. GPO October 1995), Preface.

<sup>42</sup> Department of the Army, *FM 71-100-2 Infantry Division Operations: Tactics, Techniques, and Procedures*, (Washington D.C. GPO August 1993), I.

<sup>43</sup> *FM 71-100-2*, 8-1.

<sup>44</sup> *FM 71-100-2*, 8-1.

<sup>45</sup> *FM 71-100-2*, 8-2.

<sup>46</sup> *FM 71-100-2*, 8-3.

<sup>47</sup> *FM 71-100-2*, 8-5 through 8-10.

<sup>48</sup> Department of the Army, *FM 71-3 The Armored and Mechanized Infantry Brigade*, (Washington D.C. GPO January 1996), ii.

<sup>49</sup> *FM 71-3*, C-6.

<sup>50</sup> *FM 71-3*, References-2.

<sup>51</sup> Department of the Army, *FM 71-2 The Tank and Mechanized Infantry Battalion Task Force*, (Washington D.C. GPO September 1988, with change 1-1994), 1-14.

<sup>52</sup> David B. Hain, 46.

<sup>53</sup> *FM 71-2*, A-28.

<sup>54</sup> *FM 71-2*, A-29.

<sup>55</sup> *FM 71-2*, A-30.

<sup>56</sup> *FM 71-123*, B-23.

<sup>57</sup> Department of the Army, *FM 17-15 Tank Platoon*, (Washington D.C. GPO April 1996), Preface.

<sup>58</sup> *FM 17-15*, 1-5.

<sup>59</sup> *FM 17-15*, 3-6.

<sup>60</sup> FM 17-15, 5-17.

<sup>61</sup> FM 17-15, B-1.

<sup>62</sup> FM 17-15, B-1.

<sup>63</sup> FM 17-15, B-2. These same points are also made in the follow on Appendix E, Operations Other Than War.

<sup>64</sup> Department of the Army, FM 90-10-1 *An Infantryman's Guide to Combat in Built-up Areas*, (Washington D.C. GPO with change 1, October 1995), Preface.

<sup>65</sup> FM 90-10-1, 1-1 & 1-2.

<sup>66</sup> FM 90-10-1, N-1 through N-4.

<sup>67</sup> Charles Whiting, *Bloody Aachen*, (New York: Stein and Day, 1976), 17.

<sup>68</sup> Charles B. MacDonald, *The Siegfried Line Campaign*, (Washington D.C.: Center of Military History, 1984), 307-308.

<sup>69</sup> Ibid., 310. See also LTC D.M. Daniel, "The Capture of Aachen -- Personnel Experiences of a Battalion Commander," (Fort Leavenworth, KS 1947), 5-14. John R. Kennedy, *Players or Spectators? Heavy Forces for MOUT*, (Fort Leavenworth, KS: School of Advanced Military Studies, United States Army Command and General Staff College -- Monograph, December 1989), 12-16.

<sup>70</sup> MacDonald, 311.

<sup>71</sup> Whiting, 134.

<sup>72</sup> Dwight D. Eisenhower, *Crusade in Europe*, (New York: Doubleday, 1958), 312.

<sup>73</sup> Whiting, 16.

<sup>74</sup> Ibid., 17.

<sup>75</sup> Michael Dewar, *War in the Streets: The Story of Urban Combat from Calais to Khafji*, (Great Britain: BPCC Hazell Books, 1992), 42.

<sup>76</sup> John Strawson, *The Battle for Berlin*, (New York: Charles Scribner's Sons, 1974), 147.

<sup>77</sup> Lilita L. Dzirkals, *Military Operations in Built-Up Areas: Essays on Some Past, Present, and Future Aspects*, (Santa Monica, CA: Rand Corporation, 1976), 41. See also Marshal of the Soviet Union G. K. Zhukov, *Vosponimaniia i Razmyshleniia* (*Reminiscences and Reflections*, Vol 2, 2d ed. (Moscow: Novosti, 1974), 348-352.

<sup>78</sup> A. L. Getman, *Tanks are Moving on Berlin: 1941-1945*, (Moscow: Nauka, 1973), 350-352.

<sup>79</sup> Dewar, 48.

<sup>80</sup> Ibid., 40.

<sup>81</sup> Dzirkals, 39. This was taken from Major General V. Cherniaev, *Some Peculiarities of Military Art in Berlin Operations*, *Voenno-Istoricheskii Zhurnal*, No. 4, April 1975, 109-111.

<sup>82</sup> Eric Hammel, *Fire in the Streets: The Battle for Hue, TET 1968*, (Chicago, IL: Contemporary Books, 1990) 301 & 152.

<sup>83</sup> Hammel, 91.

<sup>84</sup> Ibid., 300.

<sup>85</sup> Don Oberdorfer, *The Turning Point in the Vietnam War*, (New York: Da Capo Press, 1971), 199.

<sup>86</sup> Dewar, 68.

<sup>87</sup> United States Department of the Army Human Engineering Laboratory, *Modern Experiences in City Combat*, (Aberdeen Proving Ground, Maryland: Abbott Associates, March, 1987), 84.

<sup>88</sup> Hassan Badri, *The Ramadan War, 1973*, (New York: Hippocrene Books, 1979), 119.

<sup>89</sup> *Modern Experiences in City Combat*, 84-85.

<sup>90</sup> Avraham Adan, *On the Banks of the Suez*, (Novato, California: Presidio Press, 1980), 428.

<sup>91</sup> *Modern Experiences in City Combat*, 85.

<sup>92</sup> M. V. Zakharov, *Liberation of Southeast and Central Europe by the Troops of II and III Ukrainian Fronts*, (Moscow: Nauka, 1970), 17.

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<sup>93</sup> *Modern Experiences in City Combat*, 85.

<sup>94</sup> Adan, 344.

<sup>95</sup> *Modern Experiences in City Combat*, 31.

<sup>96</sup> Randall Steeb, Keith Brendley, Dan Norton, John Bondanella, Richard Salter, and Terrell G. Covington, *An Exploration of Integrated Ground Weapons Concepts for Armor/Anti-Armor Missions*, (Santa Monica, CA: Rand Corporation, 1991) 3.

<sup>97</sup> David B. Hain, *Sufficiency of Doctrine for the use of Armor in Military Operations on Urban Terrain*, 135.

<sup>98</sup> FM 90-10, 1-1.

<sup>99</sup> Anthony H. Cordesman and Abraham R. Wagner, *The Lessons of Modern War: Volume 1*, (Boulder, Colorado: Westview Press, 1990), 57.

<sup>100</sup> James R. Arnold, *Tet Offensive -- 1968*, 72.

<sup>101</sup> Interview with Captain James M. Burt, USA, Recipient, Congressional Medal of Honor conducted 2 November 1996 at Fort Leavenworth, Kansas.

<sup>102</sup> Trevor N. Dupuy, *Elusive Victory: The Arab-Israeli Wars, 1947-1974*, quote of Chaim Herzog, (Fairfax, Virginia: Hero Books, 1984), 591.

<sup>103</sup> *Ibid.*, 590-591.

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